Utilities Policy 18 (2010) 53–61

Contents lists available at ScienceDirect

Utilities Policy

journal homepage: www.elsevier.com/locate/jup

"Social capitalism" in renewable energy generation: China and California comparisons☆

Woodrow W. Clark II [1], Xing Li*,[2]

Clark Strategic Partners, PO Box 17975, Beverly Hills, CA 90210, United States.

ARTICLE INFO

Article history:
Received 1 August 2008
Received in revised form
1 November 2008
Accepted 1 May 2009

Keywords:
Economics
Energy infrastructures
Renewable energy
Social capitalism

ABSTRACT

With a population of over 1.3 billion people, demand for renewable energy is expected to grow to a USD $12 billion market in the near term. Under Renewable Energy Law (REL) in February 2005 in the People's Republic of China (PRC) passed by the National Congress, renewable energy projects will be able to receive a range of financial incentives starting in 2006, which will more than double the PRC current renewable energy generation from 7% to 15% by 2020. Most of the increase will be in hydroelectric generated power. Nonetheless, the nation and especially the provinces are moving rapidly to develop a wide range of renewable energy generation including solar, wind, geothermal and run of the river.

Because China practices "social capitalism" as expressed in it's recurrent Five Year National Plans since 1999, the national government and all the provinces have programs, unlike many western and industrialized nations, to "plan" and provide for infrastructures. This paper concerns only the energy infrastructure sector and renewable energy generation in particular. The planning process includes financial incentives and investments which are a major part of the Chinese law focused on "encouraging foreign investment industries". The key part of the law is to guarantee long-term power purchase agreements with state owned and controlled "utilities". In short, China may have gotten the economics of the energy sector correct in its concern for planning and finance.

The paper develops these energy infrastructure ideas along with the legal and financial requirements as "lessons" learned from the USA and especially California. These lessons now apply to China and allow it to learn from the American mistakes. Empirical data will be drawn from work done in China that examine the renewable energy generation and infrastructures and hence allow the RPC and its Provinces to "leap frog "the mistakes of other developed nations. Further lessons will be learned from provinces and related infrastructures in China, such as water, transportation, environment, waste and telecommunications. More significantly, the USA and western industrialized nations may now learn from the Chinese.

1. Background

China has established itself as "social capitalist" nation over the last decade as it moves away from a strict communist nation into one that combines western capitalism with socialist principles (Clark and Li, 2003). Meanwhile meeting the challenges of an economic annual growth rate reported at 9% annually for two decades, the nation confronts serious structural reform. Energy is a significant and core sector. The PRC has the second largest electricity supply system in the world. Since implementation of reform and opening-up policy in the early and mid-1990s, the power industry has grown over 8% per year in terms of installation capacity and generation. The country has 385 GW in installed capacity (at the end of 2003) and a total length of 803,505 km of above 35 kV transmission lines (at the end of 2002). The hydro, the

☆ Clark gave this paper given at the Western Economic International Association Annual meeting in San Diego, CA in July 06 about one year into the ABD Project on IMAR. Basic concepts apply now and for the future of the IMAR and PRC. Comparisons and perspectives are needed for the EU, Japan and USA due to the significance of energy and the global economic crises continuing in 2009.

* Corresponding author.
E-mail address: wwclark13@gmail.com (W.W. Clark II).

[1] Dr. Clark was the Senior Foreign Energy Advisor for Inner Mongolia Autonomous Region, PRC. He is a qualitative economist who is Managing Director of Clark Strategic Partners in Los Angeles, CA. His most recent book is Sustainable Communities due in Oct 09 from Springer Press.

[2] Professor Li Xing teaches development policy and theory at Aalborg University, Denmark. His work in China has resulted in a China Center at Aalborg University and most recent publication is, Globalization & Transnational Capitalism: crises, opportunities and alternatives.

0957-1787/$ – see front matter © 2009 Published by Elsevier Ltd.
doi:10.1016/j.jup.2009.05.003

thermal, and the nuclear power capacity amounted to 92.17 GW (24%), 285.64 GW (74%), and 6.19 GW (2%) respectively (Han et al., 2005).

"China faces a challenge similar to that it did two decades ago – it aims to quadruple GDP before 2020 while only doubling energy use to meet energy security, social welfare, and environmental imperatives" (Sinton et al., 2005). The PRC's electricity generation in 2003 amounted to 1910.58 TWh and electricity consumption was 1889.12 TWh. Industry is the largest consumer of electricity with a share of 77%. The shares of agriculture, residential, and other consumers are estimated at 3.6%, 12.3% and 6.7% respectively. Currently, China's electric power industry has entered a new development phase with large grid, large generation plants, high-voltage transmission, and advanced automatic control systems (Han et al., 2005, see Appendix A).

"In order to solve the energy problem, Chinese government works out two solutions. One is to promote the energy conservation, speed up the construction of a thrifty type economic system and society, largely improve the efficiency of energy utilization, lead the social production and consumption to a sustainable pattern, thus to bridge the gap of the energy resource. The other is to enhance the exploration and development of domestic energy resource, accelerate the generation of coal, electricity, oil, natural gas, as well as the construction of renewable energy strive to adjust and optimize the energy structure. At the same time, China should proactively participate international energy development and collaboration, take advantage of foreign energy resource as to ensure the civil energy supply." (Han et al., 2005, see Appendix A).

Under social capitalism, the PRC seeks to open up targeted sectors, like energy, to private capital, foreign investment and entrepreneurial economic development. However, lessons from developed nations are important. In Denmark and other Nordic countries who have similar social-economic overall policies about "social capitalism" like the PRC. For example, in order for private and public sectors to collaborate successfully in what Clark and Lund (2001) call "civic-markets", the central government must set up finance programs that have certain requirements. The key was that the government remains at least a controlling equity partner in the newly established venture for an established period to time (Clark and Jensen, 1997). The same concept applies well to developing nations and new members to the European Union, such as Hungary who were "privatizing" their energy sector in the mid and late 1990s with "difficult results" (Clark, 2000a,b).

In the case of California's "de-regulated" (similar to privatization and liberalization elsewhere) energy sector that took effect in 1996, publicly controlled power plants were 100% sold to private companies outright from 1996 to 2001 resulting in disastrous consequences including State-wide rolling black outs, State Government budget deficits and the State going bankrupt. Nonetheless, there were both good results or new opportunities found (Clark and Bradshaw, 2004) and bad lessons learned (Clark and Demirag, 2005; Clark, 2001, 2002a,b) and that have helped change public policies in California and America in general.

Reform is top on the PRC agenda as well. Sinton et al. (2005) among others have analyzed the energy sector and made recommendations. In China, the national transmission lines belong to two state-owned grid companies founded in December 2002 in compliance with the State Council's power system reform strategy and program. The country's power generation capacity belongs to five state-owned power generation group companies founded in December 2002 and other generation companies. Despite significant growth in installed capacity and generation, the country continued to face shortages of electricity supply in 2003 (Han et al. 2005).

Consequently, some 22 provinces, autonomous regions, and municipalities had to cut off electricity at peak times. In order to guarantee more power supply, China is accelerating construction of new electricity plants and power grids. One of the core issues is, are these new plants environmentally friendly? That is will they help or hinter environmental protection for the regions and cities that are demanding more energy generation, but hopefully not at a long-term atmospheric cost. At the same time, the government has adopted a series of incentive and punitive measures encouraging balanced electricity consumption. According to the forecast of the China Electricity Industry Association, China's power generation capacity will grow by 9% in 2004, while the consumption of electricity will increase by 12% (Xinhua News, 2004).

China's electricity consumption per capita is very low compared to most other developed nations. However, the forecasted demand increase for electricity will be huge in the future. According to the forecasts of Energy Research Institute, the demand for electricity will increase with annual growth rate over 6% in the next 20 years and could be even about 7%. Based on that, national demand, China would need energy generation between 2400 and 2800 TWh in 2010 and between 4000 and 5400 TWh by 2020 (Han et al., 2005).

To meet this demand, the required installed capacity is from 850 to 1000 GW in 2020. The ERI study suggests that the hydro electricity capacity has to be increased to 200 GW in 2020 from the present size of 84.55 GW (Han et al., 2005). The PRC has abundant natural coal resources (see Atwood et al., 2002 for clean coal options) and the "nuclear power" option as well to consider in meeting its energy demands.[3] Nonetheless, increased capacities from other renewable energy sources are also top on the national policy agenda.

As Han et al. (2005) note, "the new reform plan approved on April, 2002, a regulatory committee would be set up to encourage competition and issue licenses to environmentally qualified operators." While Sinton et al. (2005) argued for a Ministry of Energy (MOE) where all energy issues would be coordinated, much like the USA Department of Energy, the PRC created The State Electricity Regulatory Commission (SERC), which was officially established with the following missions:

- Developing operating rules for the electric market; regulating operation of the electric market and ensuring fair competition
- Providing reference of electricity adjustment for National Development and Reform Commission (NDRC) which is in charge of electricity price
- Regulating and monitoring production quality of power industry
- Issuing license of and managing production of power industry
- Managing disputes of power industry
- Regulating implementation of social public benefit policies (Han et al., 2005).

As Han et al. (2005) discuss, the "SERC is also the first regulatory commission in the public utilities sector in China. In late 2003, the

[3] Coal-based thermal generating capacity in 2020 will reach 600–650 GW. Natural gas generating capacity will rise up to 60–80 GW. The size of nuclear capacity and other sources of energy are expected to increase as well during this period. In China, energy resources for electric generation are mainly scattered in the west, while electricity consumption is concentrated in the center, east, and south. So China needs transmitting power from west to east, exchanging power between south and north, and enhancing nationwide interconnection. As coal is expected to play an important role, promotion of clean coal technologies (including high efficient decoking and dust eliminating equipment and sealed equipment for coal transmission) for new power plants is essential from environmental perspectives. Large-scale power construction and hydroelectric construction without damaging the local environment is also an area of concern (Han et al., 2005, See Appendix A).